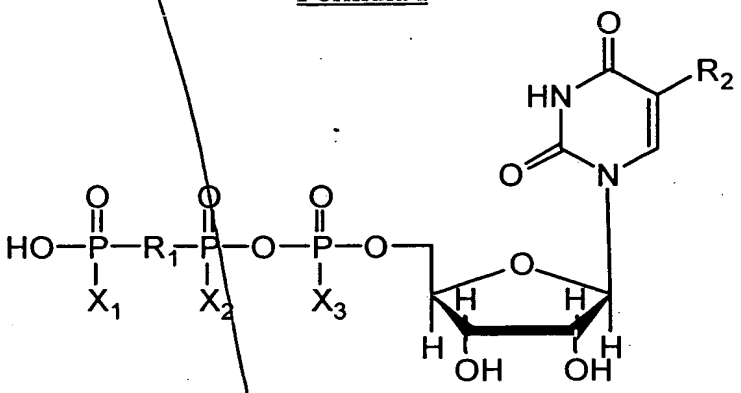
WHAT IS CLAIMED IS:

Sub A1

1. A method of stimulating cervical and vaginal secretions in a mammal in need thereof by administering an effective secretion stimulating amount of a compound of Formulas I, II, III, or IV:

Formula I



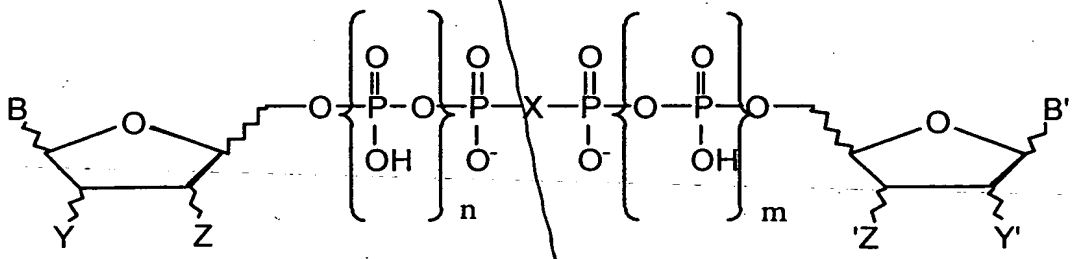
wherein:

X_1, X_2 and X_3 are each independently either O^- or S^-;

R_1 is O, imido, methylene or dihalomethylene;

R_2 is H or Br; preferably, R_2 is H; or

Formula II



wherein:

X is oxygen, methylene, difluoromethylene, imido;

n = 0, 1, or 2;

m = 0, 1, or 2;

Sub A1

n + m=0,1, 2, 3, or 4; and

B and B' are each independently a purine residue or a pyrimidine residue linked through the 9- or 1- position, respectively;

Z = OH or N_3;

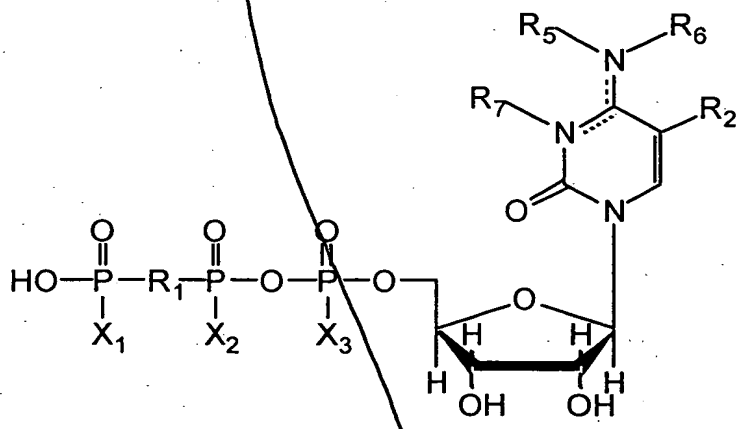
Z' = OH or N_3;

Y = H or OH;

Y' = H or OH;

provided that when Z is N_3, Y is H or when Z' is N_3, Y' is H; or

Formula III



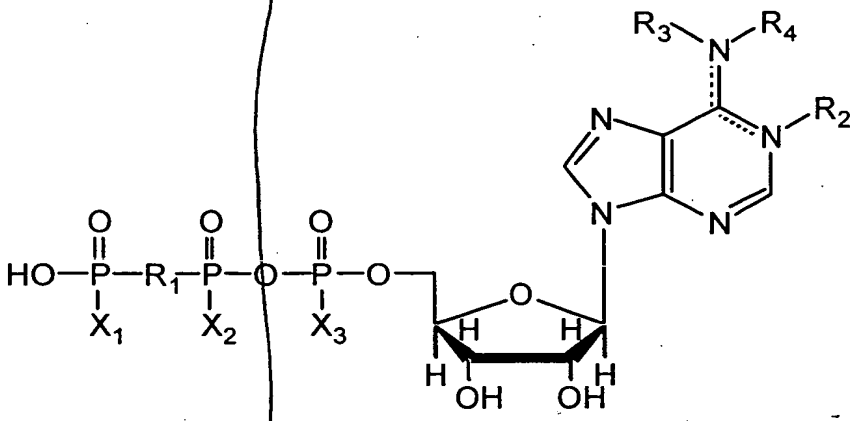
wherein:

R_1, X_1, X_2 and X_3 are defined as in Formula I;

R_5 and R_6 are H while R_7 is nothing and there is a double bond between N-3 and C-4 (cytosine), or

R_5, R_6 and R_7 taken together are -CH=CH-, forming a ring from N-3 to N-4 with a double bond between N-4 and C-4 (3,N^4-ethenocytosine) optionally substituted at the 4- or 5-position of the etheno ring; or

Formula IV



wherein:

R_1, X_1, X_2, and X_3 are defined as in Formula I;

R_3 and R_4 are H while R_2 is nothing and there is a double bond between N-1 and C-6 (adenine), or

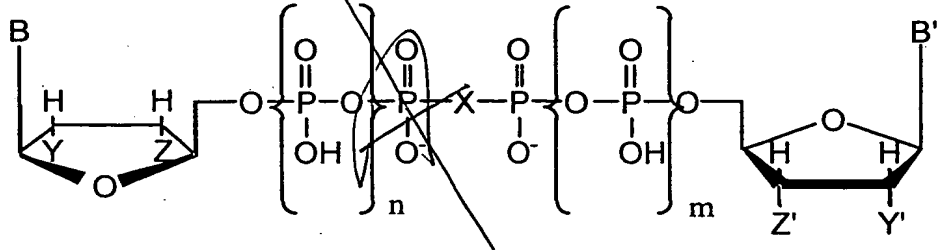
R_3 and R_4 are H while R_2 is O and there is a double bond between N-1 and C-6 (adenine 1-oxide), or

R_3, R_4, and R_2 taken together are -CH=CH-, forming a ring from N-6 to N-1 with a double bond between N-6 and C-6 (1,N6-ethenoadenine);

or pharmaceutically acceptable esters or salts thereof.

2. The method of claim 1 wherein the compounds of Formula II are those of Formula IIa:

Formula IIa



wherein:

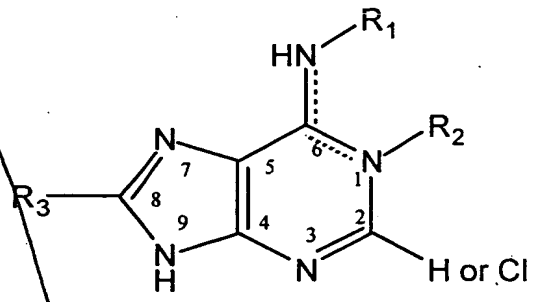
X=O;

n+m=1 or 2;

Z, Z', Y, and Y'=OH;

B and B' are defined in Formulas IIc and IId:

Formula IIc



R_2 is O or is absent; or

R_1 and R_2 taken together may form optionally substituted 5-membered fused imidazole ring; or

R_1 of the 6-HNR_1 group or R_3 of the 8-HNR_3 group is chosen from the group consisting of:

(a) arylalkyl (C_{1-6}) groups with the aryl moiety optionally substituted,

(b) alkyl,

(c) ([6-aminohexyl]carbamoylmethyl),

(d) ω-amino alkyl (C_{2-10}),

(e) ω-hydroxy alkyl (C_{2-10}),

(f) ω-thiol alkyl (C_{2-10}),

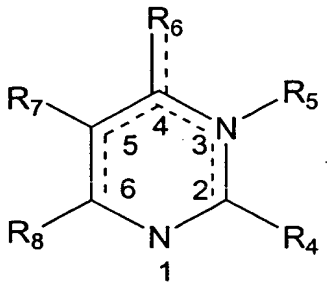
(g) ω-carboxy alkyl (C_{2-10}),

(h) the ω-acylated derivatives of (b), (c) or (d) wherein the acyl group is either acetyl, trifluroacetyl, benzoyl, or substituted-benzoyl alkyl(C_{2-10}), and

(i) ω-carboxy alkyl (C_{2-10}) as in (e) above wherein the

carboxylic moiety is an ester or an amide;

Formula IId



wherein:

R_4 is hydroxy, mercapto, amino, cyano, aralkoxy, C_{1-6} alkylthio, C_{1-6} alkoxy, C_{1-6} alkylamino or dialkylamino, wherein the alkyl groups of said dialkylamino are optionally linked to form a heterocycle;

R_5 is hydrogen, acyl, C_{1-6} alkyl, aroyl, C_{1-5} alkanoyl, benzoyl, or sulphonate;

R_6 is hydroxy, mercapto, alkoxy, aralkoxy, C_{1-6}-alkylthio, C_{1-5} disubstituted amino, triazolyl, alkylamino or dialkylamino, wherein the alkyl groups of said dialkylamino are optionally linked to form a heterocycle or linked to N^3 to form an optionally substituted ring;

R_5 - R_6 together forms a 5 or 6-membered saturated or unsaturated ring bonded through N or O at R_6, wherein said ring is optionally substituted;

R_7 is selected from the group consisting of:

(a) hydrogen,

(b) hydroxy,

(c) cyano,

(d) nitro,

(e) alkenyl, wherein the alkenyl moiety is optionally linked through oxygen to form a ring optionally substituted with alkyl or aryl groups on the carbon adjacent to the oxygen,

(f) substituted alkynyl

(g) halogen,

(h) alkyl,

(i) substituted alkyl,

(j) perhalomethyl,

(k) C_{2-6} alkyl,

(l) C_{2-3} alkenyl,

(m) substituted ethenyl,

(n) C_{2-3} alkynyl and

(o) substituted alkynyl when R_6 is other than amino or substituted amino;

R_8 is selected from the group consisting of:

(a) hydrogen,

(b) alkoxy,

(c) arylalkoxy,

(d) alkylthio,

(e) arylalkylthio,

(f) carboxamidomethyl,

(g) carboxymethyl,

(h) methoxy,

(i) methylthio,

(j) phenoxy and

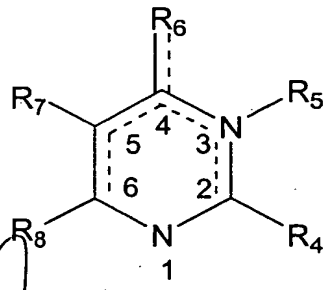
(k) phenylthio.

wherein the substituted derivatives of adenine are adenine 1-oxide; 1,N6-(4- or 5-substituted etheno) adenine; 6-substituted adenine; or 8-substituted aminoadenine, where R' of the 6- or 8-HNR' groups are chosen from among: arylalkyl (C_{1-6}) groups with the aryl moiety optionally functionalized; alkyl; and alkyl

groups with functional groups therein, selected from the group consisting of ([6-aminohexyl]carbamoylmethyl)-, and ω-acylated-amino(hydroxy, thiol and carboxy) derivatives where the acyl group is acetyl, trifluroroacetyl, benzoyl or substituted-benzoyl and the carboxylic moiety is present as the ethyl or methyl ester derivative or the methyl, ethyl or benzamido derivative;

B or B' or both in Formula IIb may be a pyrimidine with the general formula of Formula IId, linked through the 1-position:

Formula IId



wherein:

R_4 is hydroxy, mercapto, amino, cyano, aralkoxy, C_{1-6} alkoxy, C_{1-6} alkylamino, and dialkylamino, the alkyl groups optionally linked to form a heterocycle;

R_5 is hydrogen, acyl, C_{1-6} alkyl, aroyl, C_{1-5} alkanoyl, benzoyl, or sulphonate;

R_6 is hydroxy, mercapto, alkoxy, aralkoxy, C_{1-6}-alkylthio, C_{1-5} disubstituted amino, triazolyl, alkylamino, or dialkylamino, where the alkyl groups are optionally linked to form a heterocycle or linked to N-3 to form an optionally substituted ring;

R_7 is hydrogen, hydroxy, cyano, nitro, alkenyl, with the alkenyl moiety optionally linked through oxygen to form a ring optionally substituted on the carbon adjacent to the oxygen with alkyl or aryl groups, substituted alkynyl or hydrogen where R_8 is amino or substituted amino and halogen, alkyl, substituted alkyl, perhalomethyl, C_{2-6} alkyl, C_{2-3} alkenyl, or ethenyl (optionally substituted by

allylamino, bromvinyl and ethyl propenoate, or propenoic acid), C_{2-3} alkynyl or substituted alkynyl when R_6 is other than amino or substituted amino and together R_5 - R_6 may form a 5- or 6-membered saturated or unsaturated ring bonded through N or O at R_6, such a ring may contain substituents that themselves contain functionalities;

R_8 is hydrogen, alkoxy, arylalkoxy, alkylthio, arylalkylthio, carboxamidomethyl, carboxymethyl, methoxy, methylthio, phenoxy, or phenylthio; or

X=O;
n+m=3 or 4;
Z, Z', Y, and Y'=OH;
B=uracil;
B' is defined in Formulas IIc and IId; or

X=O;
n+m=1 or 2;
Z, Y, and Y'=OH;
Z'=H;
B=uracil;
B' is defined in Formulas IIc and IId; or

X=O;
n+m=0, 1, or 2;
Z and Y=OH;
Z'=N_3;
Y'=H;
B=uracil;
B'=thymine; or

X=O;

n+m=0, 1, or 2;

Z and Z'=N_3;

Y and Y'=H;

B and B'=thymine; or

X=CH_2, CF_2, or NH;

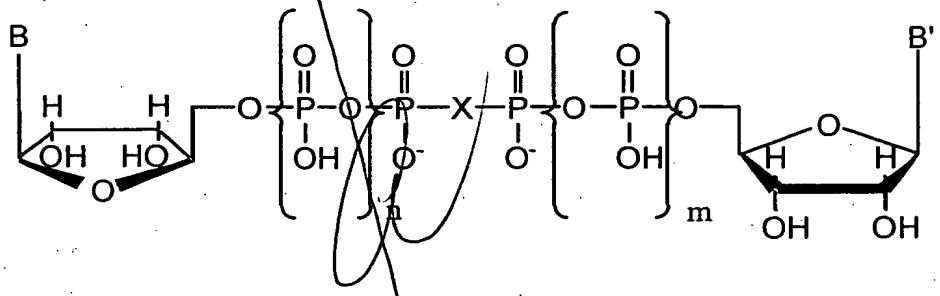
n and m=1;

Z, Z', Y, and Y'=OH;

B and B' are defined in Formulas IIc and IId.

3. The method of claim 1 wherein the compounds of Formula II are those of Formula IIb:

Formula IIb



wherein:

X is oxygen, methylene, difluoromethylene, or imido;

n = 0 or 1;

m = 0 or 1;

n + m = 0, 1, or 2; and

B and B' are each independently a purine residue, as in Formula IIc as described in claim 2, or a pyrimidine residue, as in Formula IId as described in claim 2, linked through the 9- or 1- position, respectively; provided that when B and B' are uracil, attached at N-1 position to the ribosyl moiety, then the total of m + n equals 3 or 4 when X is oxygen.

4. The method of claim 1 wherein R_2 of Formula I is H.

5. The method of claim 1 wherein the furanose sugar of Formula II is in the ß-D-configuration.

6. A method of treating a mammal with vaginal dryness by administering an effective vaginal dryness treatment amount of a compound of Formulas I, II, III, or IV as described in claims 1-5.

7. A pharmaceutical composition comprising a compound of Formulas I, II, III, or IV as described in claims 1-5 together with a pharmaceutically acceptable carrier therefor in the form of a liquid or gel suspension.

8. The method of claim 6 wherein the amount of compound of Formulas I, II, III or IV administered to the mammal is sufficient to achieve a concentration on the cervical and/or vaginal mucosa of from about 10^{-7} moles/liter to about 10^{-1} moles/liter.

9. The method of claim 6 wherein the amount of compound of Formulas I, II, III, or IV administered to the mammal is sufficient to achieve a daily dose of between 1 to 1000 milligrams.

10. A method of treating a mammal with vulvar pain by administrating an effective vulvar pain treatment amount of a compound of Formulas I, II, III, or IV as described in claims 1-5.